



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,184	09/08/2000	Xiang-Gen Xia	131*198	3318

23416 7590 04/19/2004

CONNOLLY BOVE LODGE & HUTZ, LLP  
P O BOX 2207  
WILMINGTON, DE 19899

EXAMINER
----------

WILSON, ROBERT W

ART UNIT	PAPER NUMBER
----------	--------------

2661

DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/658,184

Applicant(s)

XIA, XIANG-GEN

Examiner

Robert W Wilson

Art Unit

2661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

**1.0** The application of Xiang-Gen Xia entitled "PRECODED OFDM SYSTEMS ROBUST TO SPECTRAL NULL CHANNELS AND VECTOR OFDM SYSTEMS WITH REDUCED CYLIC PREFIX LENGTH" which was filed on 9/8/2000 with benefit based upon 60/153,489 dated 9/11/1999. Claims 1-8 are pending.

#### *Drawings*

**2.0** The drawings in this application are objected to by the Draftsperson as informal. Any drawing corrections requested, but not made in the prior application should be repeated in this application if such changes are still desired. If the drawings were changed and approved during the prosecution of the prior application, a petition may be filed under 37 CFR 1.182 requesting the transfer of such drawings, provided the parent application has been abandoned. However, a copy of the drawings as originally filed must be included in the 37 CFR 1.60 application papers to indicate the original content.

#### *Claim Rejections - 35 USC § 112*

**3.0** **Claims 1-8** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring to **Claim 1**, the claim limitation of "inserting one or more zeros between each of two sets of K consecutive information symbols,..., removing spectral nulls of the ISI channel without knowing the channel information, and without increasing the encoding/decoding complexity" are taught on Pg 3. The details describing how to implement the Precoded OFDM system which performs the claim limitation of "inserting one or more zeros between each of two sets of K consecutive information symbols,..., removing spectral nulls of the ISI channel without knowing the channel information, and without increasing the encoding/decoding

Art Unit: 2661

complexity” are not taught in the specification so that one of ordinary skill in the art could implement the OFDM Precoding System without undue experimentation.

Referring to **Claim 8**, the claim limitation of “A vector OFDM system ....means for blocking together each K consecutive information symbols as a Kx1 vector sequence, reducing the data rate overhead of the original cyclic prefix insertion by K times and improving the bit error rate (BER) performance of the vector OFDM system” is taught per Pgs 4-5. The details describing how to implement the vector OFDM system which performs the claim limitation of “A vector OFDM system ....means for blocking together each K consecutive information symbols as a Kx1 vector sequence, reducing the data rate overhead of the original cyclic prefix insertion by K times and improving the bit error rate (BER) performance of the vector OFDM system” are not taught in the specification so that one of ordinary skill in the art could implement the vector OFDM System without undue experimentation.

Referring to **Claims 2 & 6**, Pgs 8-10 teach the modeling the system via vectors and matrices; however, the details of the limitation “the scalar ISI channel is converted to a matrix ISI channel” are not taught in the specification so that one of ordinary skill in the art could implement the limitation of “the scalar ISI channel is converted to a matrix ISI channel” without undue experimentation.

Referring to **Claims 3 & 7**, Pgs 8-10 teach the modeling the system via vectors and matrices; however, the details of the limitation “the matrix ISI channel is converted into N matrix ISI-free subchannels with N constant matrices” are not taught in the specification so that one of ordinary skill in the art could implement the limitation of “the matrix ISI channel is converted into N matrix ISI-free subchannels with N constant matrices” without undue experimentation.

Referring to **Claims 4 & 8**, Pgs 8-10 teach the modeling the system via vectors and matrices; however, the details of the limitation “N constant matrices are nonsquared” are not taught in the specification so that one of ordinary skill in the art could implement the limitation of “N constant matrices are nonsquared” without undue experimentation.

### ***Claim Rejections - 35 USC § 112***

**4.0** The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**5.0** **Claims 1-8** are rejected relative to 112/2<sup>nd</sup> paragraph because the metes and bounds of the claims cannot be assessed.

Referring to **Claim 1**, What is meant by “A precoded OFDM system ....removing spectral nulls of the ISI channel without ....knowing the ...and without increasing the encoding/decoding

Art Unit: 2661

complexity”? How does one assess when a precoded OFDM system removes spectral nulls of an ISI channel without knowing the channel and without increasing encoding/decoding”?

Referring to **Claim 5**, What is meant by “A vector OFDM system....and improving the bit error rate (BER) performance of the vector OFDM system”? How does one assess when a “a vector OFDM system improves the bit error rate of a vector OFDM system”?

Referring to **Claims 2 & 6**, What is meant by “the scalar ISI channel is converted to a matrix ISI channel”? How does one assess when “the scalar ISI channel is converted to a matrix ISI channel”?

Referring to **Claims 3 & 7**, What is meant by “the matrix ISI channel is converted into N matrix ISI-free subchannels with N constant matrices”? How does one assess when “the matrix ISI channel is converted into N matrix ISI-free subchannels with N constant matrices”?

Referring to **Claims 4 & 8**, What is meant by “N constant matrices are nonsquared”? How does one assess when “N constant matrices are nonsquared”?

### **Conclusion**

**6.0 A searched based on the best understanding of the claims has been made to find the most pertinent art, but no statement about the invention will be appropriate at this time regarding the allowability of Claims 1-8 and no art rejection will be made in this office action regarding the claims 1-8 , due to the speculation required to interpret the claims because of their indefiniteness under 35 U.S. C. 112, 1 st and 2<sup>nd</sup> paragraphs as noted above (see In re Steele, 134 USPQ 292)**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W Wilson whose telephone number is 703/305-4102. The examiner can normally be reached on M-F (8:00-4:30).

Art Unit: 2661

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Olms can be reached on (703) 305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Robert W Wilson  
Examiner  
Art Unit 2661

RWW  
April 1, 2004



DOUGLAS OLMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600